Poonam Singha, Ph.D.

singhap@nitrkl.ac.in ; poonamsingha2652@gmail.com
+91 661 246 2909 (O)
Dept. of Food Process Engg., NIT Rourkela, Odisha - 769008
https://www.nitrkl.ac.in/FP/~singhap/
https://www.linkedin.com/in/singhapoonam/

Employment History

03/2020 – ····· **Assistant Professor.** Department of Food Process Engineering, NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA, Odisha, India.

03/2019 – 02/2020 **Post Doctoral Associate.** Department of Food Science, CORNELL UNIVERSITY, Ithaca, New York, USA.

03/2018 – 02/2019 **Post Doctoral Associate.** Department of Dairy & Food Science, SOUTH DAKOTA STATE UNIVERSITY, Brookings, South Dakota, USA.

06/2017 – 08/2017 **R&D Intern.** ROQUETTE AMERICA INC., Chicago, IL, USA.

06/2016 – 01/2017 **Product & Process Development Associate.** VETS PLUS, INC., Menomonie, Wisconsin, USA.

09/2009 – 08/2010 **Quality Control Trainee.** BRITANNIA INDUSTRIES PVT. LTD, Kolkata, WB, India.

Education

2014 – 2017 **Ph.D., South Dakota State University, Brookings, SD, USA** in Agricultural, Biosystems & Mechanical Engineering.
Specialization: *Food Process Engineering.*

2010 – 2012 **M.Tech., Jadavpur University, Kolkata, India** in Food Technology & Biochemical Engineering.

2005 – 2009 **B.Tech., Techno India, West Bengal University of Technology, Kolkata, India** in Food Technology.

Grants

- "Functionalization of pea protein using extrusion processing for development of healthy plant-based food products" (2021). **Science and Engineering Research Board (SERB)**, Department of Science and Technology, Government of India – Ongoing
  - **Role:** Principal Investigator
- "Acquisition of an Automated Total Dietary Fiber Analyzer – Value Enhancement of North American Cereal Crops". 2018-2019. **NIFA-USDA**.
  - **Principal investigator:** Padmanaban Krishnan (Dairy & Food Science Dept., SDSU).
  - **Role:** Co-PI and co-authored the proposal for grant. Participated in the brainstorm of ideas with principal investigator and collaborators. Reviewed literature and wrote draft.

Technical Skills

Equipment handled	Spray Dryer, Single & Twin-Screw Extruders.
Instrument handled	Accelerated Solvent Extractor, DSC, NIR - Spectrophotometer, UV - Spectrophotometer, Protein Analyzer, Farinograph, Mixograph, Glutomatic, Texture Analyzer, Rheometer.
Computer skills	MS Office, Design-Expert v8, Origin, SPSS.

Professional Memberships

- Institute of Food Technologists (IFT)
- American Society of Agricultural & Biological Engineers (ASABE)
- Phi Tau Sigma, The Honor Society for Food Science
- Association of Food Scientists & Technologists, India (AFSTI) - Life Member
- Institution of Engineers (India) - Life Member

Professional Involvement

Principal Coordinator	5 Day International Workshop on “Food Security and Sustainability in the Post COVID Food Processing Industry Targeting Zero Carbon Emission” (Online Mode) supported by DST-GATI, March 5-9, 2022.
Student Representative	IFT-Refrigerated and Frozen Foods Division (2013 – 2015).
President	Food Science Club at SDSU (2015 – 2016).
Judge	2018 Gamma Sigma Delta Annual Poster Competition 2017 Clean Tech Competition.
Reviewer	Trends in Food Science & Technology Journal of Food Process Engineering Journal of Food Science & Technology Journal of Food Processing & Preservation Journal of Food Science Journal of Texture Studies Cereal Chemistry Ultrasonics Sonochemistry Journal of Food Engineering Food Hydrocolloids International Journal of Refrigeration Food Research International Journal of Bioprocessing & Biotechniques Journal of Food Science and Toxicology IFT’15, IFT’16, IFT’17, IFT’18 & IFT’20 Technical Research Presentations and Scientific & Applied Sessions.

Mentoring & Supervision Experience

As a Supervisor:

Status	Ph.D. Students	M.Tech. Students	B.Tech. Students
Ongoing	02	01	02
Completed	–	01	–

Teaching Experience

National Institute of Technology Rourkela, India

Theory
- FP3105 – Food Analysis and Quality Control
- FP4206 – Emerging Technologies in Food Processing
- FP4209 – Separation Techniques in Food Processing
- FP6101 – Advanced Food Analysis and Quality Control

Labs
- FP3172 – Food Analysis and Quality Control Laboratory
- FP6171 – Advanced Food Analysis and Quality Control Laboratory

South Dakota State University, Brookings, SD

Theory
- AST 443 – Food Process and Engineering Fundamentals
- FS 351 – Principles of Food Processing
- AST 343 – Engineering Properties of Biological Materials and Lab
- FD 341 – Applied Food Science

Research Experience

Department of Food Science, Cornell University, Ithaca, NY, USA

- Responsible for scientific study of the rheology of milk protein before and after super critical CO2 extrusion.
- Responsible for functionalization of milk and vegetable protein using super critical CO2 extrusion.
- Responsible for analyzing products and preparing scientific reports.

Department of Dairy & Food Science, SDSU, Brookings, SD, USA

- Developed prediction and calibration equation for estimation of oat nutrient.
- Responsible for determination of variety and growing location effects on variability of oat constituents.

Department of Agricultural Engineering, SDSU, Brookings, SD, USA

- Performed experiments to retain the functional properties of extruded soy-based aqua feed using different gums.
- Conducted and managed a mix of 2 projects and brought both the projects to fruition by publication in journals.
- Designed experiments and analyzed data using statistical tools such as SPSS, SAS, Design-Expert.
- Studied phenolic compounds and antioxidant activity in extruded pomace based snacks.

Research Experience (continued)

- Successfully developed puffed extruded snacks from garbanzo flour and food grade distiller's grains.
- Conducted oil extraction from different oilseeds, characterized the extracted oil and studied the effects of extrusion on the oilseed meal.

Jadavpur University, Kolkata, India

- Investigated novel approach to develop food grade stable emulsion to encapsulate tocotrienol.
- Synthesized and characterized large pore mesoporous inorganic oxides (iron oxide, silica) having large surface area.
- Studied adsorption of lysozyme, bovine serum albumin and DNA at mesoporous silica-water interface.

Awards and Achievements

2017
- **MN-IFT Graduate Scholarship Award**, USA

2016
- **Texture Technologies Travel Award**, USA
- **MN-IFT Graduate Scholarship Award**, USA
- **MN-IFT Travel Award**, USA
- **Division Leadership Travel Award**, USA

2015
- **IFT Refrigerated and Frozen Food Division Outstanding Volunteer Award**, USA
- **Texture Technologies Travel Award**, USA
- **MN-IFT Graduate Scholarship Award**, USA

2014
- **Travel Award to attend NABC 26**, USA
- **Texture Technologies Travel Award**, USA
- **Awarded second prize** in IFT poster competition, USA
- **Division Leadership Travel Award**, USA
- **MN-IFT Travel Award**, USA

2012
- **GATE Fellowship – IIT Kharagpur**, India
- **UGC-BSR Research Fellowship** in Science for Meritorious Students, India

Research Publications

Journal Articles

1. Asaithambi, N., **Singha**, **P.** & Singh, S. K. (2022a). Comparison of the effect of different desugarization techniques on the functionality of egg white protein hydrolysates. *Applied Food Research*, *2*(2), 100152. https://doi.org/10.1016/j.afres.2022.100152

2. Asaithambi, N., **Singha**, **P.** & Singh, S. K. (2022b). Comparison of the effect of hydrodynamic and acoustic cavitations on functional, rheological and structural properties of egg white proteins. *Innovative Food Science & Emerging Technologies*, 103166. https://doi.org/10.1016/j.ifset.2022.103166

3. Asaithambi, N., **Singha**, **P.** & Singh, S. K. (2022d). Recent application of protein hydrolysates in food texture modification. *Critical Reviews in Food Science and Nutrition*. https://doi.org/10.1080/10408398.2022.2081665

4. Barbhuiya, R. I., **Singha**, **P.**, Asaithambi, N. & Singh, S. K. (2022). Ultrasound-assisted rapid biological synthesis and characterization of silver nanoparticles using pomelo peel waste. *Food Chemistry*, *385*, 132602. https://doi.org/10.1016/j.foodchem.2022.132602

5. Dash, D. R., Singh, S. K. & **Singha**, **P.** (2022). Recent advances on the impact of novel non-thermal technologies on structure and functionality of plant proteins: A comprehensive review. *Critical Reviews in Food Science and Nutrition*. https://doi.org/10.1080/10408398.2022.2130161

6. Pavani, M., **Singha**, **P.**, Dash, D. R., Asaithambi, N. & Singh, S. K. (2022). Novel encapsulation approaches for phytosterols and their importance in food products: A review. *Journal of Food Process Engineering*, *45*(8), e14041. https://doi.org/10.1111/jfpe.14041

7. Pavani, M., **Singha**, **P.** & Singh, S. K. (2022). Development of phytosterol enriched functional edible oils: Study of physical, chemical, thermal and structural properties. *Journal of Scientific & Industrial Research*, *81*(5), 549–560.

8. Arora, B., **Singha**, **P.** & Rizvi, S. S. H. (2021). Supercritical Fluid Extrusion: Die design and physicochemical properties of milk protein extrudates. *Innovative Food Science & Emerging Technologies*, *68*, 102637. https://doi.org/10.1016/j.ifset.2021.102637

9. Asaithambi, N., Singh, S. K. & **Singha**, **P.** (2021). Current status of non-thermal processing of probiotic foods: A review. *Journal of Food Engineering*, *303*, 110567. https://doi.org/10.1016/j.jfoodeng.2021.110567

10. Barbhuiya, R. I., **Singha**, **P.** & Singh, S. K. (2021). A comprehensive review on impact of non-thermal processing on the structural changes of food components. *Food Research International*, *149*, 110647. https://doi.org/10.1016/j.foodres.2021.110647

11. Yoon, A. K., **Singha**, **P.** & Rizvi, S. S. H. (2021). Steam vs. SC–CO_2 - based extrusion: Comparison of physical properties of milk protein concentrate extrudates. *Journal of Food Engineering*, *292*, 110244. https://doi.org/10.1016/j.jfoodeng.2020.110244

12. Arora, B., Yoon, A., Sriram, M., **Singha**, **P.** & Rizvi, S. S. H. (2020). Reactive Extrusion: A review of the physicochemical changes in food systems. *Innovative Food Science & Emerging Technologies*, *64*, 102429. https://doi.org/10.1016/j.ifset.2020.102429

13. Gopirajah, R., **Singha**, **P.**, Javad, S. & Rizvi, S. S. H. (2020). Emulsifying properties of milk protein concentrate functionalized by supercritical fluid extrusion. *Journal of Food Processing and Preservation*, *44*(10), e14754. https://doi.org/10.1111/jfpp.14754

14. Asaithambi, N., **Singha**, **P.**, Dwivedi, M. & Singh, S. K. (2019). Hydrodynamic cavitation and its application in food and beverage industry: A Review. *Journal of Food Process Engineering*, *42*(5), e13144. https://doi.org/10.1111/jfpe.13144

15. Singh, S. K., **Singha**, **P.** & Muthukumarappan, K. (2019a). Modeling and optimizing the effect of extrusion processing parameters on nutritional properties of soy white flakes- based extrudates using response surface methodology. *Animal Feed Science and Technology*, *254*. https://doi.org/10.1016/j.anifeedsci.2019.06.001

16. **Singha**, **P.**, Singh, S. K. & Muthukumarappan, K. (2019a). Textural and structural characterization of extrudates from apple pomace, defatted soy flour and corn grits. *Journal of Food Process Engineering.*, *42*(4), e13046. https://doi.org/10.1111/jfpe.13046

17. **Singha**, **P.** & Muthukumarappan, K. (2018). Single screw extrusion of apple pomace - enriched blends: Extrudate characteristics and determination of optimum processing conditions. *Food Science and Technology International*, *24*(5), 447–462. https://doi.org/10.1177/1082013218766981

18. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2018b). Influence of processing conditions on apparent viscosity and system parameters during extrusion of distiller's dried grains-based snacks. *Food Science & Nutrition*, *6*(1), 101–110. https://doi.org/10.1002/fsn3.534

19. **Singha**, **P.**, Singh, S. K., Muthukumarappan, K. & Krishnan, P. (2018b). Physicochemical and nutritional properties of extrudates from food grade distiller's dried grains, garbanzo flour and corn grits. *Food Science & Nutrition*, *6*(7), 1914–1926. https://doi.org/10.1002/fsn3.769

20. **Singha**, **P.** & Muthukumarappan, K. (2017). Effects of processing conditions on the system parameters during single screw extrusion of blend containing apple pomace. *Journal of Food Process Engineering*, *40*(4), e12513. https://doi.org/10.1111/jfpe.12513

21. **Singha**, **P.** & Muthukumarappan, K. (2016b). Quality changes and freezing time prediction during freezing and thawing of ginger. *Food Science & Nutrition*, *4*(4), 521–533. https://doi.org/10.1002/fsn3.314

22. Brown, M. L., Fallahi, P., Muthukumarappan, K., **Singha**, **P.** & Sindelar, S. (2015). A comparative study of the effects of non-starch polysaccharide gums on physical properties of single-screw extruded aquafeed. *Journal of Food Processing and Technology*, *6*(6), 457. https://doi.org/10.4172/2157-7110.1000457

Books and Chapters

1. Barbhuiya, R. I., Singh, S. K. & **Singha**, **P.** (2022). Mangosteen Wastes: Chemistry, Processing, and Utilization (K. Muzaffar, S. A. Sofi & S. A. Mir, Eds.). In K. Muzaffar, S. A. Sofi & S. A. Mir (Eds.), *Handbook of Fruit Wastes and By-Products*. Boca Raton, CRC Press. https://doi.org/10.1201/9781003164463-8

2. Barbhuiya, R. I., **Singha**, **P.** & Singh, S. K. (2022). Pomelo Wastes: Chemistry, Processing, and Utilization (K. Muzaffar, S. A. Sofi & S. A. Mir, Eds.). In K. Muzaffar, S. A. Sofi & S. A. Mir (Eds.), *Handbook of Fruit Wastes and By-Products*. Boca Raton, CRC Press. https://doi.org/10.1201/9781003164463-2

3. Singh, S. K., Rajpurohit, B. & **Singha**, **P.** (2021). Camelina (*Camelina sativa*) seed (B. Tanwar & A. Goyal, Eds.). In B. Tanwar & A. Goyal (Eds.), *Oilseeds: Health Attributes and Food Applications*. Singapore, Springer, Singapore. https://doi.org/10.1007/978-981-15-4194-0_18

4. Muthukumarappan, K. & **Singha**, **P.** (2016). Grain drying systems (D. R. Heldman & C. I. Moraru, Eds.). In D. R. Heldman & C. I. Moraru (Eds.), *Encyclopedia of Agricultural, Food, and Biological Engineering*. Boca Raton, CRC Press. https://doi.org/10.1081/E-EAFE2-120053467

Conference Presentations

1. Asaithambi, N., **Singha**, **P.** & Singh, S. K. (2022c). Effect of desugarization on functional, antioxidant properties and in-vitro digestion of egg-white protein hydrolysates, In *3rd International Conference on Bioprocess for Sustainable Environment & Energy (ICBSEE-2022)*, NIT Rourkela, India, June 20-24.

2. Singh, S. K., **Singha**, **P.** & Dwivedi, M. (2019). Evaluation of extrudates from sorghum-grape pomace blends by extrusion processing, In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.
3. Singh, S. K., **Singha**, **P.** & Muthukumarappan, K. (2019b). Viscosity modeling of aquafeed dough in a single screw extruder, In *ASABE Annual International Meeting*, Boston, MA, USA, July 7-10.
4. **Singha**, **P.**, Deshpande, T. & Krishnan, P. (2019). Developing food quality standards for distiller's dried grains- evaluating composition, quality and safety, In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.
5. **Singha**, **P.**, Paudel, D., Caffe-Treml, M. & Krishnan, P. (2019). Rapid measurement of oat quality using near-infrared reflectance spectroscopy: A single analytical platform, In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.
6. **Singha**, **P.**, Singh, S. K. & Muthukumarappan, K. (2019b). Twin screw extrusion processing of snacks containing soy flour and apple pomace, In *ASABE Annual International Meeting*, Boston, MA, USA, July 7-10.
7. **Singha**, **P.**, Singh, S. K., Muthukumarappan, K. & Krishnan, P. (2019). Textural properties and sensory study of garbanzo and corn-based extrudates containing food grade distiller's dried grains, In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.
8. Pahariya, P., **Singha**, **P.** & Muthukumarappan, K. (2018). Fortification of low-fat yogurt with bean protein isolate, In *ASABE Annual International Meeting*, Detroit, MI, USA, Jul 29-Aug 1.
9. Singh, S. K. & **Singha**, **P.** (2018). Role of extrusion processing conditions on the properties of soy and corn-based extruded products, In *4th NDSU Annual Conference on Food for Health*, Fargo, ND, USA, July 8-11.
10. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2018a). Corn grits based extruded snacks containing garbanzo and distiller's dried grains, In *Corn Utilization & Technology Conference*, St. Louis, MO, USA, June 4-6.
11. **Singha**, **P.**, Singh, S. K., Muthukumarappan, K. & Krishnan, P. (2018a). Study on the properties of corn grits-based extruded snacks fortified with garbanzo and distiller's dried grains, In *4th NDSU Annual Conference on Food for Health*, Fargo, ND, USA, July 8-11.
12. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2017). Effect of processing conditions on system parameters during extrusion of blend containing food grade distillers dried grains, In *AACC International Annual Meeting*, San Diego, CA, USA, October 8-11.
13. **Singha**, **P.** & Muthukumarappan, K. (2016a). Extrusion of soy flour-apple pomace blends: Extrudate characteristics and optimizing process conditions, In *IFT Annual Meeting & Food Expo*, Chicago, IL, USA, July 16-19.
14. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2016a). Extrudate products with corn grits, garbanzo flour and distiller's dried grains developed for food applications: Physical properties, sensory acceptability and glycemic index, In *IFT Annual Meeting & Food Expo*, Chicago, IL, USA, July 16-19.
15. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2016b). Optimization of extrusion processing parameters for the development of snacks from corn grits, garbanzo flour and distiller's dried grains developed for food applications, In *AACC International Annual Meeting*, Savannah, GA, USA, October 23-26.

16. **Singha**, **P.** & Muthukumarappan, K. (2015a). Influence of the extrusion processing parameters on the physico-chemical properties of apple pomace based soy extrudates, In *IFT Annual Meeting & Food Expo*, Chicago, IL, USA, July 11-14.

17. **Singha**, **P.** & Muthukumarappan, K. (2015b). Study of the influence of extrusion processing parameters on the physico-chemical properties of apple pomace based soy extrudates, In *ASABE North Central Intersectional Meeting*, Fargo, ND, USA, April 10-11.

18. **Singha**, **P.**, Muthukumarappan, K. & Krishnan, P. (2015). Influence of the extrusion processing parameters on the physico-chemical and sensory characteristics of garbanzo flour and distillers grain based expanded snacks, In *IFT Annual Meeting & Food Expo*, Chicago, IL, USA, July 11-14.

19. **Singha**, **P.**, Fallahi, P. & Muthukumarappan, K. (2014). Experimental and quality characteristics of ginger during freezing and thawing, In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 21-23.

20. **Singha**, **P.**, Halder, D., Mitra, A. & Muthukumarappan, K. (2014). Adsorption study of lysozyme on mesoporous silica, In *Conference of Food Engineering (CoFE)*, Omaha, NE, USA, April 7-9.

21. **Singha**, **P.** & Muthukumarappan, K. (2014a). Effect of different freezing and thawing methods on the quality of foods- a review, In *ASABE/CSBE North Central Intersectional Meeting*, Brookings, SD, USA, March 28-29.

22. **Singha**, **P.** & Muthukumarappan, K. (2014b). Effect of different gums on the functional properties of soy-based nile tilapia feed, In *NABC 26: New DNA-Editing Approaches: Methods, Applications and Policy for Agriculture*, Ithaca, NY, USA, October 8-9.

23. **Singha**, **P.** & Bhattacharjee, P. (2009). Design of a pediatric functional food for rural children of west bengal, India, In *National Conference on Future of Food Biotechnology*, NIT Durgapur, India, January 9-10.